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10/502,185	07/21/2004	Sung-Cheol Yoon	HNG-0004	5544
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/502,185	Applicant(s) YOON ET AL.	
	Examiner William K. Cheung	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6,8,10-13,16-20,23-28 and 35-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6,8,10-13,16-20,23-28 and 35-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>111607</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Request for Continued Examination

1. The request filed on October 19, 2007 for a Request for Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 10/502,185 is acceptable and a RCE has been established. An action on the RCE follows.
2. In view of amendment filed October 19, 2007, claims 2-5, 7, 9, 14, 15, 21, 22, 29-34 have been cancelled, and new claims 35-42 have been added. Claims 1, 6, 8, 10-13, 16-20, 23-28, 35-42 are pending. The examiner acknowledges the receipt of the IDS filed November 16, 2007.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 6, 8, 10-13, 16-20, 23-28, 35-40, 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 (line 23), the recitation “ $[-O-(A)-O-]_n M(R^1)_{2-n}$ ” is considered indefinite. The recited “[O-(A)-O-]” seems to indicate the group is divalent. Is it really divalent?

Claim 1 (line 27-29), the recitation of A groups are considered indefinite because Claim 1 (line 23), the recitation “ $[-O-(A)-O-]_n M(R^1)_{2-n}$ ” requires A to be divalent, while the claimed groups are mono-valent.

Claim 35 (line 24), the recitation of a period is considered indefinite. While the period signals the end of the claim, the claim continues to recite the Chemical Formula 3 (claim 25-33).

Claim 42 (line 18-25), the recitation “anion” is considered indefinite because the elements cited within the Markush group are not anion, or possess no negative charge.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 6, 8, 10-13, 16-19, 25-28, 35-42 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lipian et al. (US 6,455,650), for the reasons adequately set forth from paragraph 5 of the office action of April 19, 2007.

*The invention of claims 1, 6, 8, 10-13, 16-20, 23-28, 35-40 relates to a **method for preparing a cycloolefin polymer** containing polar functional groups, comprising:*

*a) **preparing a catalyst mixture** including*

*i) a precatalyst represented by **Chemical Formula 1**, containing a **Group 10 transition metal** having a **ligand containing oxygen ions bonded to the metal**;*

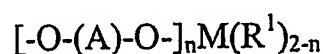
*ii) a **first cocatalyst** which is an **organic compound** containing a **Group 15 element**;*

and

*iii) a **second cocatalyst** which is capable of providing an anion **and weakly coordinating to the metal of the precatalyst**; and*

*b) **subjecting a monomer solution comprising a norbornene-based compound having an **exo isomer content of more than 50 mol%** and containing a **polar functional group** to an addition polymerization reaction in the presence of an **organic solvent** and the catalyst mixture, at a temperature of **80-200 °C**, the total amount of the **organic solvent being 50-800 %** by weight based on the total weight of the monomer contained in the monomer solution, and the product yield of the **cycloolefin polymer being 50% by weight** or more based on the total weight of the monomer:***

Chemical Formula 1



wherein

M is a Group 10 transition metal;

n is 1 or 2;

A represents a linear or branched C₁₋₂₀ alkyl, aryl, aralkyl, alkenyl group or a linear or branched C₁₋₂₀ alky1, aryl, aralkyl or alkenyl group containing a hetero atom including Si, Ge, S, O, or N;

R¹ is hydrogen; a linear or branched C₁₋₂₀ alkyl, alkenyl or vinyl group; a C₃₋₁₂ cycloalkyl group unsubstituted or substituted with a hydrocarbon; a C₆₋₄₀ aryl group unsubstituted or substituted with a hydrocarbon; a C₆₋₄₀ aryl group containing at least one hetero atom; a C₇₋₁₅ aralkyl group unsubstituted or substituted with a hydrocarbon; or a C₃₋₂₀ alkynyl group.

*The invention of claims 41-42 relates to a **method for preparing a cycloolefin polymer containing polar functional groups**, comprising:*

*a) **preparing a catalyst mixture including***

- i) a **precatalyst** selected from the group consisting of (allyl)Pd(acetyl acetonate), (allyl)Pd(acetate), (acetate)Pd(acetyl acetonate), and a mixture thereof;
- ii) a **first cocatalyst** which is an organic compound containing a **Group 15 element**; and
- iii) a **second cocatalyst** which is capable of providing an **anion and weakly coordinating to the metal of the precatalyst**; and
- b) **subjecting a monomer solution comprising a norbornene-based compound containing a polar functional group to an addition polymerization reaction in the presence of an organic solvent and the catalyst mixture, at a temperature of 80-200 °C, the total amount of the organic solvent being 50-800 % by weight based on the total weight of the monomer contained in the monomer solution, and the product yield of the cycloolefin polymer being 50% by weight or more based on the total weight of the monomer.**

Lipian et al. (col. 112-3, claims 1 and 2; col. 115-116, claims 16 and 17; col. 40, line 19-59) disclose a method for preparing a cycloolefin polymer that is substantially identical to applicants' claims 1, 6, 8, 10-13, 16-19, 23, 25-28, 35-42. Lipian et al. (col. 29, line 45 to col. 32, line 23) clearly disclose cycloolefin polymer having a structure VII (col. 30, line 12-19) having at least one polar functional group as claimed (col. 30, line 62-67).

Lipian et al. (col. 78-79, examples 160-163) clearly disclose a precatalyst comprising two different cocatalysts. Regarding claim 25, Lipian et al. (col. 21, line 16-20) clearly disclose the precatalyst as claimed. Regarding claim 26, Lipian et al. (col. 128, line 46) clearly disclose the cocatalyst as claimed. Regarding claim 27, Lipian et al. (col. 26, line 57-59; col. 130, line 19-22) clearly disclose the cocatalyst as claimed.

Regarding claim 28, Lipian et al. (col. 30, line 62 to col. 32, line 55; particularly col. 30, line 62-67) clearly disclose monomers as claimed.

In working examples of Lipian et al. (col. 49-74, examples 23-25, 28-31, 34, 37, 39, 42, 44-47, 51, 53, 58-76, 84, 88, 89, 95, 98, 102, 105, 107, 110-112, 115-117, 123-125, 129 132, 139) clearly disclose processes characterized with a product yield of greater than 50 wt% or more based on the total weight of the monomer. It would not be difficult to one of ordinary skill in art to recognize that it is desirable to obtain a process capable of producing a product yield of greater than 50 wt% or more.

In view of the reasons set forth above, although Lipian et al. do not contain a working example using the claimed catalyst for polymerizing the disclosed monomers at a product yield of greater than 50 wt%, Lipian et al. still have clearly disclosed the catalyst and the monomers as claimed.

Therefore, in view of the substantially identical catalyst and monomer disclosed in Lipian et al. and as claimed, the examiner has a reasonable basis that the claimed "product yield of greater than 50 wt%" is inherently possessed in Lipian et al. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Further, motivated by the expectation of success that a product yield of greater than 50 wt% can be obtained as demonstrated by some of the working examples in Lipian et al. (col. 49-74, examples 23-25, 28-31, 34, 37, 39, 42, 44-47, 51, 53, 58-76, 84, 88, 89, 95, 98, 102, 105, 107, 110-112, 115-117, 123-125, 129 132, 139), it would

have been obvious to one of ordinary skill in art to perform the polymerization process of Lipian et al. with the disclosed catalyst and monomers accordingly to obtain a yield of 50 wt% feature as claimed.

Regarding the claimed "norbornene-based compound having an exo isomer content of more than 50 mol%", Lipian et al. (col. 29, line 45 to col. 32, line 23) clearly disclose cycloolefin polymer having a structure VII (col. 30, line 12-19) having at least one polar functional group as claimed (col. 30, line 62-67). The examiner believes that the claimed "exo isomer content of more than 50 mol%" is inherently possessed in Lipian et al. because the functionalization norbornene inherently can result isomers that are endo, exo, or the mixture thereof, depending on the reaction condition. This is because although exo is the form that is thermodynamically more stable as compared to the endo form, sometimes, the reaction can be kinetically more favorable for the formation of the endo form. Therefore, the examiner has a reasonable basis that the isomers of norbornene type materials do not necessarily in a 50/50 (endo/exo) racemic mixture form.

Regarding the precatalyst limitations of claims 41-42, Lipian et al. (col. 127, claim 54; col. 129, claim 61) together clearly teach a precatalyst comprises platinum, acetates or acetylacetonates, and an anionic hydrocarbyl containing ligand (R'). Regarding (R'), Lipian et al. (col. 3, line 47-50) clearly indicate that the anionic hydrocarbyl containing ligand can be allylic ligands. Regarding the claimed polymerization temperature and the amount of solvent to be used in claims 41-42, Lipian et al. (col. 40, examples 17-46)

clearly teach polymerization processes involving the claimed temperature range of 80-200 °C, and the claimed amount of solvent.

8. Claims 20, 23, 24 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lipian et al. (US 6,455,650), for the reasons adequately set forth from paragraph 6 of the office action of April 19, 2007.

In view of paragraph 5 of instant office action, Lipian et al. clearly disclose the cycloolefin polymers used in the optical anisotropic film of claims 20, 23, 24.

Regarding the claimed optical anisotropic film, Lipian et al. (col. 43, line 56 to col. 44, line 6) disclose the various applications where good optical properties are required. Of the applications listed, optical film is cleared taught (col. 44, line 2). Regarding claim 24 which claims a display device, the examiner believe that the claimed "display device" is inherently possessed in Lipian et al. because windows (col. 44, line 4) can be viewed as a display device or part of a display device.

Regarding the claimed retardation value, molecular weight, refractive indexes, and equations 1 and 3, the examiner has a reasonable basis to believe that these properties are inherently possessed in Lipian et al. in view of the substantially composition and process of polymer prepared in Lipian et al. and the composition and process of claims 1, 20. Since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re

Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977); In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Regarding claim 23 which claims that the optical film is used as a negative C-plate type optical compensation film for liquid crystal displays, applicants must recognize that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Response to Arguments

9. Applicant's arguments filed November 16, 2007 have been fully considered but they are not persuasive. Applicants argue that Lipian et al. are silent on the instantly claimed invention involving "a norbornene-based compound having an exo isomer content of more than 50 mol%".

Regarding the claimed "norbornene-based compound having an exo isomer content of more than 50 mol%", Lipian et al. (col. 29, line 45 to col. 32, line 23) clearly disclose cycloolefin polymer having a structure VII (col. 30, line 12-19) having at least one polar functional group as claimed (col. 30, line 62-67). The examiner believes that the claimed "exo isomer content of more than 50 mol%" is inherently possessed in Lipian et al. because the functionalization norbornene inherently can result isomers that are endo, exo, or the mixture thereof, depending on the reaction condition. This is

because although exo is the form that is thermodynamically more stable as compared to the endo form, sometimes, the reaction can be kinetically more favorable for the formation of the endo form. Therefore, the examiner has a reasonable basis that the isomers of norbornene type materials do not necessarily in a 50/50 (endo/exo) racemic mixture form.

In view of the 112 rejection set forth, the rationale set forth the instant rejection is adequate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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William K. Cheung, Ph. D.

Primary Examiner

WILLIAM K. CHEUNG
PRIMARY EXAMINER

January 6, 2008